[0017] For example, in one embodiment, the method may include calculating the number of times during a particular cycle that the measured load exceeds the predetermined threshold.

[0018] In yet other embodiments, an absolute value indicative of the measured toe load and/or heel load is used to determine the activity index value. For example, the method for determining activity of the user may comprise determining a toe load value and a heel load value for each step of the user. This load value data is then processed to determine a momentum value for the particular user. For instance, such processing may include filtering the load value data, such as through a low pass filter, and/or assigning the data weighted values. The method further includes extracting a weight component and an activity component from the determined momentum value. For instance, the weight of the user maybe acquired through the use of an external scale, the user profile data, and/or the sensors that measure a force value when both the toe and heel of the user are in contact with the ground. The remaining activity component is then used to determine the activity index of the user.

[0019] For example, in one embodiment, an algorithm for calculating the activity index of the user is as follows. A weight factor ("W") is calculated through the following equation:

$$W_n=(1-a)*\text{ToeLoadmax}_n+a*\text{HeelLoadmax}_n;$$

where "n" represents the step number; "ToeLoadmax" represents the maximum measured toe load; "HeelLoadmax" represents the maximum measured heel load; and where "a" is a variable representing the relationship between the ToeLoadmax and the HeelLoadmax measurements. This data is then filtered, such as through the following equation:

$$Wf_n=(1-b)*Wf_{n-1}+b*W_n$$

where b may be a constant variable, such as 0.05 (wherein the last monitored step only accounts for 5% of the total Wfn). The activity index ("A") may then be calculated by:

$$A=Wf/(\text{weight of user in kilograms})$$

[0020] Because the weight of the user does not generally change during the calculation process, then an increase in "A" can be attributed to an increase in Wf, which represents a more dynamic pattern of motion. It should also be recognized that the ToeLoadmax and HeelLoadmax variables may be set to zero during initialization of the calculation process. Furthermore, in other embodiments, the measurements of the toe load and/or heel load may comprise measurements other than the maximum load measurements. For example, the measurements of the toe load and/or heel load may comprise an average measurement during the length of one stride.

[0021] In one embodiment, the device may comprise an orthotic device or a prosthetic device, such as, for example, a prosthetic foot, or any of the devices described in the applications incorporated by reference herein.

[0022] In a further embodiment, the method includes comparing the activity index value for the user against a pre-determined activity index for a variety of different devices to select an appropriate device for the user.

[0023] One embodiment of the invention includes a method of selecting a device associated with a limb of a user. The selection method of one embodiment includes: providing a device having a sensor secured thereto; measuring with the sensor a performance characteristic of the device while the device is in use by a user; comparing the performance with a pre-determined matrix of performance data of different devices; and selecting an appropriate device for the user based on the comparison.

[0024] In one embodiment, the device may comprise an orthotic device or a prosthetic device, such as, for example, a prosthetic foot, or any of the devices described in the applications incorporated by reference herein. In further embodiments, the sensor may be configured to measure a toe and/or a heel load.

[0025] One embodiment of the invention includes a method of aligning a device associated with a limb of a user. The method of one embodiment includes: providing a device having at least one sensor secured thereto; measuring with the sensor a performance characteristic of the device while the device is in use by a user; transmitting data from the sensor to a microprocessor and processing the data; and aligning the device based on the data.

[0026] In one embodiment, the device may comprise an orthotic device or a prosthetic device, such as, for example, a prosthetic foot, or any of the devices described in the applications incorporated by reference above. In further embodiments, the sensor may measure load characteristics of the limb and/or device.

[0027] In one embodiment, such alignment may include anterior and/or posterior alignment of the device, such as through manual and/or automatic adjustments. In other embodiments, alignment may comprise adjustments for medial/lateral movement. For example, a plurality of resistive strips placed on both sides of a foot device may be used to determine toe load, heel load, foot moment, and/or movement in the medial/lateral plane.

[0028] In further embodiments, the method may additionally comprise at least one of the following: providing real-time alignment information during adjustment; providing information regarding alignment, activity, step count, combinations of the same, or the like through a computer interface; providing information on how a specific device has been treated; and/or providing recommendations on device choice based on measurements.

[0029] In yet other embodiments, information gathered from the sensors may be used to electronically and/or automatically adjust the device. For example, sensor signals could be used to trigger a release point in a knee-type device or to communicate with an associated neuromusculoskeletal (NMS) unit.

[0030] One embodiment of the invention includes a method of measuring bending of a device associated with a limb of a user. The method of one embodiment comprises providing a device having at least one sensor secured thereto; and measuring a bending characteristic of the device using the sensor as the limb is utilized by a user. For example, the method may be used to measure and/or detect large deflections/bending of materials, such as for example, carbon and other highly flexible materials used with the device. In one embodiment, the device may comprise an orthotic device or a prosthetic device, such as, for example, a prosthetic foot, or any of the devices described in the